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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,837	04/06/2006	Mitsuhiro Horio	P29478	5021
7055 7590 05/09/2008 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER LACLAIR, DARCY D				
ART UNIT		PAPER NUMBER		
4171				
NOTIFICATION DATE		DELIVERY MODE		
05/09/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

# Office Action Summary

**Application No.**

10/574,837

**Applicant(s)**

HORIO ET AL.

**Examiner**

Darcy D. LaClair

**Art Unit**

4171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/CF)  
Paper No(s)/Mail Date 7/26/06, 9/21/06, 7/18/07, 1/15/08.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.



## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 6, 9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant describes a polymer having at least one block, as well as a diene compound random copolymer. It is unclear whether this component is intended to be a block or random copolymer. This needs to be clarified with out adding new matter.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7-11, and 12-13 are rejected under 35 U.S.C. 102 (b) as being anticipated by Doki et al. (US 2002/0115790).
3. Claim 1 requires a polyoxymethylene resin comprising (A) 10-99.5 parts of a polyoxymethylene resin, and 0.5 to 90 parts by weight each of (B) a polymer with at

least one block made of a hydrogenated aromatic vinyl compound with the main dispersion peak of  $\tan \delta$  at 60°C or below, and optionally (C) a polyolefin resin in the ratio 100/0 to 20/80 to (B). Doki teaches a polyoxymethylene resin composition which comprises (I) 100 parts by weight of a polyoxymethylene polymer and (II) 1-200 parts by weight of a thermoplastic elastomer with the main dispersion peak temperature of -30°C to 50°C. (abstract, par 7) Doki later teaches that the preferred thermoplastic elastomer (II) comprises a vinyl aromatic monomer. (par 32) This meets the claim as presented, because the polyolefin is not required, but optional.

4. With respect to optional component (C) of claim 1, Doki additionally teaches that the polyoxymethylene resin composition may contain 1 - 100 parts by weight of a polyolefinic resin. (par 8) While not required, this meets component (C) of claim 1.

5. Claim 2 requires the additional presence of (D) 0.1 to 30 parts of a silicone grafted polyolefin resin per 100 parts by weight of the sum of parts (A), (B), and (C).

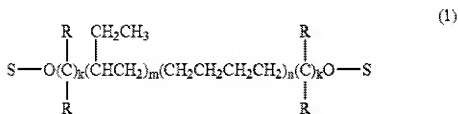
Doki teaches that there may be 0.1 to 30 parts by weight of a lubricant. (par 8) He further teaches that this lubricant may be a silicone-grafted polyolefinic resin. (par 37)

6. Claim 3 recites (E) 0.05 to 20 parts of a lubricant and/or (F) 0.1 to 150 parts of an inorganic filler per 100 parts by weight of (A), (B), and (C). Doki teaches that there may be 0.1 to 30 parts by weight of a lubricant. (par 8) He teaches that the lubricant may be silicone compounds and/or alkylene glycol copolymers, and liquid ethylene- $\alpha$ -olefin random copolymers. (paragraph 37) Doki also teaches that other additives, including inorganic fillers such as glass fibers, talc, wollastonite and hydrotalcite, electrically conductive carbon black, pigments, and others may be included. Doki is silent as to the

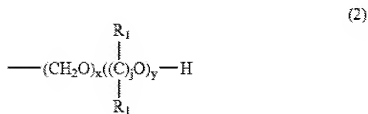
Art Unit: 4171

percentage content of these inorganic fillers; addition of fillers is linearly dependant, based on the desired property such as color, conductance, physical properties, processability, or the like, and may be added in any amount not contradictory to the invention.

7. Claim 4 and 9 recite a polymethylene resin where the resin comprises a polyoxymethylene block copolymer (A-1) having an average molecular weight of 10,000 to 500,000, represented by the formula



Where the portion other than S is a hydrogenated liquid polybutadiene residue having a hydroxyalkyl group at each end with a molecular weight 500 to 10,000 and m and n are both 2-98% by mole, and  $n + m = 100$  mole percent. The repeating units may be random or block. R may be hydrogen, alkyl groups, substituted alkyl groups, aryl groups and substituted aryl groups.

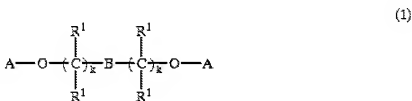


and S is

Art Unit: 4171

where R1 is hydrogen, alkyl groups, substituted alkyl groups, aryl groups and substituted aryl groups. Each k, and j may be an integer 2-6. x = 95-99.9% by mole, y = 5 to 0.1% by mole, and x+y = 100% by mole.

8. With respect to claim 4, Doki teaches a preferred polyoxymethylene block copolymer (i-2) with an average molecular weight of 10,000 – 500,000 represented by the formula



where A is



(Optionally with a terminal group ending in -O-H):

And B is a hydrogenated polybutadiene having 2-98 mole % 1,2-bonds and 2-98% 1,4 bonds being present in the polymer chain either in random or in blocks. Here, Doki's 1,2 bonds are the "m" group of the instant application, and Doki's 1,4 bonds are the "n"

Art Unit: 4171

group of the instant application. Doki's B group is identical to the "portion other than S" of the instant application. Here, A is a genus of the instant application's formula (2), with the form containing an optional terminal group representing the same species. Doki's R1 corresponds to the instant application's "R" and may be hydrogen, alkyl groups, substituted alkyl groups, aryl groups and substituted aryl groups. Doki's R2 corresponds to the instant application's "R1" and may be hydrogen, alkyl groups, substituted alkyl groups, aryl groups and substituted aryl groups. Further comparison may be made in column 1 of page 2, paragraph 14-18, however the essence is that these two polymers are identical in scope.

9. Claim 5 and 10 recite a polymethylene resin composition where the A-1 resin of claim 4 or 9 and (A-2) a polyoxymethylene copolymer with oxymethylene groups as its main repeating unit and oxyalkylene groups of 2 or more carbon atoms in an amount of 0.1 to 10% by mole are used in combination, and the A-1/A2 ratio is 10 – 100. Doki teaches that the second group of the polyoxymethylene (i-1) has oxymethylene groups as the main recurring unit and contains an oxyalkylene group of 2 or more carbon atoms in an amount of 0.1 to 5 mole %. (par 13) This substantially covers the range of the instant application. Doki further teaches that the ratio of i-1 (corresponding to A-2) to i-2 (corresponding to A-1) can be in the range 0/100 to 95/5. This corresponds to a ratio of 0.05 to 100 of A-1/A-2. (par 18) This encompasses the entire range presented by applicant.

10. Claim 7 and 12 require that the polyolefin resin be obtained by modification with a  $\alpha,\beta$ -unsaturated carboxylic acid and/or an acid anhydride thereof. Doki teaches



generally that a variety of polyolefinic resins are available and may be modified with unsaturated carboxylic acids. (par 44) Specifically, Doki presents an example polyolefinic resin as a ethylene-butene copolymer which is treated with maleic anhydride. (par 104)

11. Claim 8 and 13 recite a molded or shaped article obtained by molding, cutting, or both. Doki indicates that the moldings may be made from the resin, and the moldings may be further shaped by cutting.

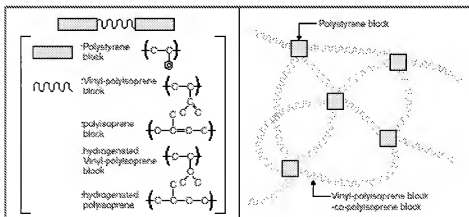
12. Claims 6 and 11 are rejected under 35 U.S.C. 102 (b) as being anticipated by Doki et al. (US 2002/0115790) with evidentiary support from Kuraray, Co. product specification website.

13. Claims 6 and 11 require the polymer (B) of earlier claims comprises at least one polymer block (B1) composed of mainly (>90%) aromatic vinyl compound units and at least one (3%-90% by weight) aromatic vinyl compound-conjugated diene compound random block copolymer (B2). The content of B1 must range from 50 to 90% and the main dispersion peak of  $\tan \delta$  must be in the range 60°C to -30°C. Doki teaches that the thermoplastic elastomer (II) having a  $\tan \delta$  from -30°C to 50°C can include a variety of thermoplastic elastomers, (par 27) but the preferred option is to use a vinyl aromatic monomer in the thermoplastic elastomer. (par 33) This thermoplastic elastomer can comprise a segment (a) with a styrene monomer, preferably vinyl aromatic monomer and (b) a monomer copolymerizable with the styrene monomer, preferably isoprene or isoprene-butadiene. (par 34) The optional monomers taught by Doki largely overlap

Art Unit: 4171

with those enumerated in the specification of the instant application (par 53) as support for the claims. Doki teaches that the segment (b) should contain less than 20% or less than 40% vinyl bonds (par 34). In the examples, Doki shows four examples of the elastomer (II). (par 91 – 95) These include the compound HYBRAR-5127, which is also used (b-3) in the instant application (par 125), and described as an "polymer having at least one aromatic vinyl compound-conjugated diene compound random copolymer block." The manufacturer, Kuraray, provides a diagram on their website:

Molecular Structure Model



This clearly demonstrates the makeup of this resin includes those moieties required in varying amounts based on the particular product, and it is known to alter the ratio of the moieties. (See supporting document Kuraray website.) Based on the description given by Kuraray's website and its use by applicant, the examiner has reason to believe this compound and its family would meet the limitation of claim 6 and 11.

***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Kielhorn-Bayer et al. (US 5,859,146) teaches a thermoplastic molding material and molded items composed of 10-99.5% by weight of thermoplastic polymer selected from a group consisting of polyoxymethylenes, polyolefins, other polymers, or mixtures thereof, 0.5-80% of a thermoplastic polyurethane, 0-50% by weight of fibrous or particulate filler, and 0-30% by weight of additives and processing assistance, which include lubricants, stabilizers, and organic fillers and plasticizers.

16. Ohdaira et al. (US 4,670,508) discloses a thermoplastic resin composition and molded articles therefrom composed of 70%-90% of at least one thermoplastic resin including polyamides, polyacetals (specifically polyoxymethylene), polyesters, and polycarbonates, and 30% to 2% of a high molecular weight polyolefin powder. This composition may also include conventional ingredients and additives such as lubricants and fillers, including inorganic fillers.

17. Sera et al. (US 6,359,094) teaches a styrenic polymer of similar makeup as applicant's component (B), including vinyl monomers which may be copolymerized with dienic monomers. Moldings composed of this polymer are described, and use of organic or inorganic fillers is described. Further, the composition may additionally contain ordinary thermoplastic resins including polyoxymethylenes, polyolefins, and

Art Unit: 4171

other mixtures, which could easily be the thermoplastic resins described by Kielhorn-Bayer or Ohdaira.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Thursday 7:30-5.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 4171

Darcy D. LaClair  
Examiner  
Art Unit 4171

/DDL/